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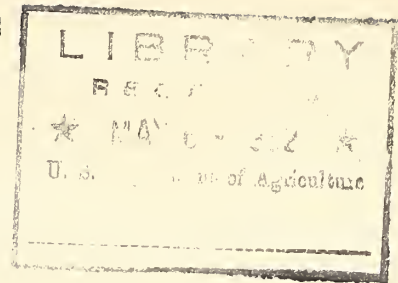
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UNITED STATES DEPARTMENT OF AGRICULTURE

WEATHER BUREAU

Office of the Chief

Washington



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CIRCULAR

INSTRUCTIONS FOR THE PREPARATION AND ISSUANCE OF
THREE-HOURLY FORECASTS.

Introduction

Three-hourly summaries and forecasts have now been issued from certain designated airport stations for about two and a half years. During that period the stations have been given considerable latitude in developing the form and phraseology, with the thought that definite instructions concerning these would be of little value until they could be based on actual experience. Naturally, although the forecasts issued are similar in a general way, some differences, particularly in the use of terms and phrases, have arisen among the various stations issuing them. It is desirable to make this service essentially uniform throughout the country, particularly in view of the fact that pilots in many cases fly along airways for which different centers issue 3-hourly forecasts for adjoining sections.

The purpose of these instructions is to arrive at a uniform practice, so far as is practicable at the present time. The instructions will become effective April 16, 1932, and will remain in force until revised. Copies should be made available to officials of air transport companies and to pilots, in order that they may learn the meaning and scope of all authorized terms and expressions used.

I. DESCRIPTION OF GENERAL CHARACTER OF THE THREE-HOURLY SERVICE.

1. The purpose of the three-hourly service is to provide short-period forecasts at regular intervals for all flying activities in the United States. Because of the short period covered, these forecasts are relatively precise and definite, giving expected airways weather conditions in greater detail than is possible in the case of the 12-hourly special airways forecasts and 24 to 36-hourly daily weather forecasts.

2. Experience has shown that the forecasts are much more useful when issued for definite airways than for regions or zones. It has also been found that the issuing of summaries of current conditions in the area, as a basic feature of the bulletins, is not of sufficient importance to warrant continuing them. Therefore, beginning with the effective date of these instructions these will be discontinued as a general program

and the service will be limited to forecasts for definite airways, except as specified in Section VII.

II. GENERAL INSTRUCTIONS.

3. The following elements will be included in each forecast in the order indicated:

(A). General Conditions, which includes:-

- (a). Sky (i.e., sky covering)
- (b). Weather (precipitation, thunderstorms, etc.)
- (c). Obstructions to Vision (fog, smoke, haze, precipitation, etc.)

(B). Ceiling

(C). Visibility

(D). Remarks

4. The first three, (A, B, and C) will always be included and no forecasts will be issued without containing specific mention of each, except that when "clear" or "scattered clouds" are expected to obtain over the entire airway, no mention need be made of the ceiling, it being assumed that this will then be understood to be "unlimited". The "sky" element will of course always be mentioned under "General Conditions" and also, when appropriate, the "weather" and "obstructions to vision".

5. Each element will be forecast for the entire airway before passing on to the next element, i.e., the "General Conditions" over the entire airway will be covered before mention is made of "Ceiling", etc. For example:-

"CONTINUED OVERCAST WITH LIGHT RAIN AND MODERATE FOG PERSISTING. CEILINGS DANGEROUSLY LOW TO BLIND CHEYENNE TO NORTH PLATTE THENCE LOW EASTWARD. VISIBILITY GENERALLY POOR APPROACHING DANGEROUSLY POOR NEAR OMAHA".

6. Each forecast will be complete in itself, i.e., it is not enough to say, "Little change indicated", etc., as it is possible that the preceding forecast may not have been noted by the pilot or other person interested.

7. It will be proper to indicate an expected continuation of current conditions by the use of inferential terms, such as, "continued", "continuing", "persisting", etc.

8. The use of the words "generally" and "mostly" will be proper whenever the condition they modify is prevalent but does not cover the entire airway, a few stretches being free of it. For example: "Generally overcast but some broken clouds west end near end of period". "Mostly" will be used to represent a more nearly completely prevalent condition than "Generally".

9. The forecasts are to be as specific as practicable. The use of modifying terms such as "possibly", "probably", etc., will be limited to cases of uncertain conditions.

10. The forecasts will be as brief as possible, consistent with clearness and worded in such a manner as to express clearly the meaning without punctuation, except periods.

11. Distribution will be accomplished by radio and teletype where practicable. Forecasts will not be telegraphed or telephoned at Government expense, except under specific prior authority, or in cases of emergency. In all other cases they will be furnished at the expense of the person requesting them.

12. Forecasts for a particular airway will be sent by the issuing station only along the airway for which they are intended, except as it may be necessary in reaching another airway. Relays by radio or teletype may then be arranged, if practicable, at the other stations concerned, subject to the usual procedure in such cases.

13. The special airways and State forecasts issued by the District Forecast Centers will be used as a guide in all cases, particularly with regard to "sky" and "weather" conditions.

14. The term "caution advised" is authorized and will be used whenever conditions are such as likely to continue or become hazardous for flying within the forecast period. Judgment and discretion are to be exercised in the use of this term.

15. Special forecasts between the regular three-hourly periods will be issued whenever developments are foreseen which were not apparent when the last regular forecast was issued. These shall not extend beyond the current period and the necessity for their issue should be of infrequent occurrence.

III. PERIOD COVERED BY FORECASTS

16. The forecasts will cover a period of three hours beginning one hour after the regular three-hourly collection periods at 2, 5, 8, and 11 a.m. and p.m., E.S.T.

IV. FORECAST IDENTIFICATION HEADINGS.

17. The forecasts will be identified by headings in accordance with the following:-

(a). Name of airway, using recognized call letters for designation of the terminals.

(b). The time (on the 24-hour clock) which will include the beginning and ending of the period covered by the forecast. The time indicated will represent the standard in use at the issuing center.

(c). The words "airways forecast".

(d). The date, month and day using figures.

For example:- CV-WN 15-18ES AIRWAYS FORECAST 12/10.

V. TERMINOLOGY

18. The following terms will be used to forecast the "sky" element:- CLEAR; SCATTERED CLOUDS; BROKEN CLOUDS; OVERCAST; DENSE FOG. The terms will have the same limits and meanings as indicated in Circular N, 1932.

19. The "weather" element of the forecast will include types of precipitation and local atmospheric disturbances, i.e., such phenomena as thunderstorms, squalls, icing conditions, etc., expected to occur.

20. The following terms, or combinations thereof, are to be used in forecasting the "weather" element, when appropriate:

LIGHT OR HEAVY RAIN.

LIGHT OR HEAVY SNOW.

SHOWERS (not attended by lightning and thunder), or HEAVY SHOWERS if unusually heavy falls are foreseen.

LIGHT OR HEAVY MIST.

SLEET.

SNOW FLURRIES, occasional light falls of snow.

SNOW or RAIN SQUALLS, or SEVERE SNOW or RAIN SQUALLS if unusually heavy falls of snow or rain are foreseen. These conditions are identified as heavy falls of rain or snow, accompanied by strong, gusty winds, but not occurring under thunderstorm conditions.

MODERATE or SEVERE BLIZZARD CONDITIONS: when intensely cold northerly or northwesterly gales accompanied by a much reduced visibility, or visibility and ceiling, due to the fall or blowing about of snow, or both, are foreseen.

ICING CONDITIONS, or SEVERE ICING CONDITIONS if conditions are unusually favorable. To be used when the temperature, amount of water vapor, or other factors are such as to favor the formation of ice on aircraft while in flight through clouds, freezing rain, (glaze) etc.

THUNDERSTORMS, or SEVERE THUNDERSTORMS if they are expected to be unusually turbulent.

The expected or continued movement of a WIND-SHIFT LINE over the airway will always be forecast, using the terms, "mild", "moderate", or "severe" to indicate expected intensity. The rate and direction of movement are to be indicated.

TORNADOES will not be forecast, but when reported as occurring on or near the airway, this fact will be stated in the next forecast.

SANDSTORMS; DUSTSTORMS: to be forecast when conditions are considered favorable for their occurrence.

Conditions not covered, but occurring at times, will be forecast, in accordance with the judgment of the forecaster, following as nearly as possible the same line of thought as is expressed in the terms listed above.

21. The "obstructions to vision" element of the forecasts will be generally confined to the formation, continuation, and dissipation of fog, although it will be proper to mention thick haze, smoke, or dust as a continuing or dissipating condition when these are present. Local smoke and haze may be included in the visibility portion of the forecast when this is thought desirable for sake of clearness.

22. The same terms and limits will be used in forecasting fog, including ground fog, and haze, smoke, and dust, as are given for these phenomena in Circular N, 1932.

23. CEILING:- This element is to be forecast apart from visibility, although it is realized that these two elements are often so closely interrelated as to make it difficult to separate them. However, it is believed desirable to forecast them separately, even in the case of dense fog or blizzard conditions. For example:- OVERCAST WITH HEAVY SNOW APPROACHING MODERATE BLIZZARD CONDITIONS. CEILINGS BLIND. VISIBILITY ZERO. DEEP DRIFTS ALL INTERMEDIATE FIELDS.

24. The following terms are to be used in forecasting the ceiling:

BLIND.....	0 to 100 feet.
DANGEROUSLY LOW.....	Over 100 to 500 feet.
LOW	Over 500 to 1000 feet.
MODERATELY LOW.....	Over 1000 to 2000 feet.
AMPLE.....	Over 2000 to 5000 feet.
HIGH	Over 5000 to 10,000 feet.
UNLIMITED.....	Over 10,000 feet.

25. Combinations of the foregoing terms will be proper when necessary, but ranges covered should not be disproportionate, particularly in the lower levels.

26. Actual mention of altitude in feet will not be made in the forecasts.

27. VISIBILITY:- This element will be forecast immediately following the ceiling in accordance with the following terms:-

ZERO	1/5 mile or less (dense obscuration).
DANGEROUSLY POOR.....	Over 1/5 to 3/4 mile.
POOR.....	Over 3/4 to 2 miles.
LIMITED.....	Over 2 to 5 miles.
GOOD.....	Over 5 to 10 miles.
EXCELLENT.....	Over 10 miles.

28. Specific mention of miles as such is not to be made.

29. Combinations of the foregoing terms not exceeding a range of 1/2 mile below 2 miles and a range of 2 miles over the balance of the scale are proper and may be included. For example:-- VISIBILITIES POOR TO DANGEROUSLY POOR CHEYENNE TO NORTH PLATTE LIMITED NORTH PLATTE TO OMAHA.

30. REMARKS:-- These will form the last portion of the forecast and will include mention of unusually strong winds, surface and aloft, rapid pressure changes, and field and landing conditions, as discussed in the following paragraphs:

(a). Wind:-- Due to the large influence of local factors of terrain, etc., on the surface wind, this element will not be forecast unless unusual velocities and gustiness, dangerous to aircraft landings, are foreseen. Winds aloft will not be forecast, except when unusual velocities are expected to occur, or a radical change in direction is expected to take place, during the forecast period, at levels below 14,000 feet above sea level. No terminology for wind forecasts is specified, but such terms as "strong" and "gusty" are suggested.

(b). Pressure:-- An expected rise or fall of 1/10 inch or more within the forecast period will be included and designated: "Rapidly rising/falling pressure".

(c). Field conditions will be included in the forecast whenever it is expected that a definite change toward worse or better conditions will occur generally within the forecast period.

VI. MISCELLANEOUS TERMS

31. The term "locally" is authorized for use whenever the condition referred to is of minor extent and is definitely located, as for instance, "locally low Lexington".

32. The term "approaching" may be used whenever the condition in question will come near to the limits of the next lower or higher terms; viz: "Visibility poor approaching dangerously poor near Pittsburgh".

33. The term "occasional" is to be used whenever a condition is expected to occur not continuously, but at intervals.

34. Inasmuch as an airway is considered to be a line, the term "scattered" will not be used, as would be proper for an area.

VII. SPECIAL AIRWAYS SUMMARIES.

35. At forecasting centers at which there are not sufficient qualified personnel to maintain full 24-hour forecasting service, it will be proper during the forecast periods, in which this condition exists, for the personnel to issue summaries of current conditions along the airways assigned, using the terminology above outlined. No forecasts are to be included in the summaries, when issued by personnel not authorized to make such forecasts.

VIII. EXAMPLES OF FORECASTS.

36. The following examples of forecasts are intended to illustrate the usage of terms and the order of the elements discussed. It is believed that they are largely self-evident as regards the type of weather condition being illustrated and that explanatory text in this connection is not necessary.

(a). Clear weather forecasts:-

CV-WN 6-9ES AIRWAYS FORECAST 1/28 CLEAR. VISIBILITY GOOD: EXCEPT LOCALLY LIMITED BY SMOKE PITTSBURGH.

NK-BW 21-24ES AIRWAYS FORECAST 11/15 CLEAR TO SCATTERED CLOUDS. VISIBILITY EXCELLENT.

(b). Ground fog forecast:-

AU-WN 3-6ES AIRWAYS FORECAST 9/15 CLEAR WITH MODERATE TO DENSE GROUND FOG GENERAL SPARTANBURG NORTHWARD. VISIBILITY ABOVE GROUND FOG EXCELLENT.

(c). Broken clouds with some limitation of visibility:-

PA-PG 9-12ES AIRWAYS FORECAST 6/10 BROKEN CLOUDS APPROACHING OVERCAST AT PITTSBURGH NEAR END OF PERIOD. CEILINGS AMPLE. VISIBILITY GENERALLY LIMITED DUE TO HAZE BUT GOOD NEAR CALDEN.

(d). "Caution advised" forecasts:-

CV-CG 12-15ES AIRWAYS FORECAST 2/28 CONTINUED OVERCAST WITH LIGHT RAIN AND MODERATE FOG. SEVERE ICING CONDITIONS MODERATING AT CHICAGO NEAR END OF PERIOD. CEILINGS DANGEROUSLY LOW. VISIBILITY DANGEROUSLY POOR TO ZERO. CAUTION ADVISED.

CV-BF 3-6ES AIRWAYS FORECAST 3/15 OVERCAST WITH HEAVY SNOW BROOKVILLE EASTWARD. OCCASIONAL SEVERE SNOW SQUALLS CLEVELAND TO BROOKVILLE. CEILINGS AMPLE TO LOW CLEVELAND TO BROOKVILLE EXCEPT BLIND IN SNOW SQUALLS DANGEROUSLY LOW THENCE EASTWARD AND BLIND ON RIDGES. VISIBILITY GOOD TO BROOKVILLE EXCEPT DANGEROUSLY POOR IN SQUALLS DANGEROUSLY POOR THENCE EASTWARD. RAPIDLY RISING PRESSURE WEST END. CAUTION ADVISED.

(e). Thunderstorm forecast:-

OW-CX 14-17CS AIRWAYS FORECAST 7/18 SCATTERED TO BROKEN CLOUDS WITH LOCAL THUNDERSTORMS OCCURRING NORTH PLATTE WESTWARD. CEILING GENERALLY UNIMPAIRED BUT MODERATELY LOW TO LOW IN THUNDERSTORMS. VISIBILITY GENERALLY GOOD BUT POOR IN THUNDERSTORMS DUE TO HEAVY RAIN.

(f). Light precipitation forecast:-

OA-RP 18-21PS AIRWAYS FORECAST 4/22 OVERCAST WITH LIGHT
RAIN IN MOUNTAINS ELSEWHERE BROKEN TO SCATTERED CLOUDS.
CEILINGS AMPLE. VISIBILITY GOOD.

37. It is understood that authorized abbreviations would be used
in the foregoing and that the usual time and signature would be added.

IX. ASSIGNMENT OF AIRWAYS.

(For forecast purposes.)

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|---|--|
| <p>38. Albuquerque-
Winslow-Wichita
Pueblo-Albuquerque-El Paso</p> <p>39. Atlanta-
Atlanta-Jacksonville
Atlanta-Washington
Richmond-Jacksonville
Atlanta-Evansville
Atlanta-Jackson
Atlanta-New Orleans
Memphis-New Orleans
Memphis-Nashville</p> <p>40. Burbank-
Los Angeles-El Paso
Los Angeles-Winslow
Los Angeles-Las Vegas</p> <p>41. Cheyenne-
Cheyenne-Pueblo
Pueblo-Amarillo</p> <p>42. Chicago-
Chicago-Fargo
Chicago-Evansville
Chicago-St. Louis
Chicago-Cincinnati</p> <p>43. Cleveland-
Cleveland-Newark
Cleveland-Washington
Cleveland-Chicago
Cleveland-Nashville
Michigan Airways(Southern Michigan).
Indianapolis-Pittsburgh
Cleveland-Buffalo
Cleveland-Detroit</p> | <p>44. Dallas-
Dallas-Memphis
Dallas-Amarillo
Dallas-Wichita
Amarillo-Tulsa
Dallas-El Paso
Dallas-Jackson
Dallas-New Orleans
Dallas-Brownsville
San Antonio-Big Spring</p> <p>45. Kansas City-
Kansas City-Moline
Kansas City-Indianapolis
Kansas City-Tulsa
Kansas City-Denver
Kansas City-Wichita
St. Louis-Tulsa
St. Louis-Evansville</p> <p>46. Newark-
Newark-Boston
Newark-Montreal
Newark-Washington
Albany-Buffalo
Camden-Pittsburgh</p> <p>47. Oakland-
Oakland-Medford
Oakland-Los Angeles
Oakland-Reno</p> <p>48. Omaha-
Omaha-Cheyenne
Omaha-Chicago
Omaha-Kansas City
Omaha-Watertown</p> |
|---|--|

49. Portland-

Portland-Seattle
Portland-Spokane
Portland-Medford
Pasco-Boise

50. Salt Lake City-

Salt Lake City-Reno
Salt Lake City-Cheyenne
Salt Lake City-Great Falls
Salt Lake City-Las Vegas
Salt Lake City-Boise

51. It is realized that it may not now be practicable for some of the centers to issue forecasts for all the airways assigned because of lack of communication and other facilities on those airways. In such cases, they will be disregarded for the present, and added if and when practicable, the present service probably being best continued on a trip forecast basis.

C. F. Marvin
Chief of Bureau.

